

Appendix-E

PROGRAM CODE : 122 - B.Tech. Engineering Physics
DEPARTMENT : Department of Physics
YEAR : I

Teaching Scheme				Contact Hours/Week				Exam Duration (Hrs.)		Relative Weights (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
(Autumn)														
1.	MAN-001	Mathematics - 1	BSC	4	3	1	0	3	0	25	0	25	50	0
2.	PHN-101	Introduction to Engineering Physics	DCC	2	2	0	0	0	0	0	0	0	100	0
3.	PHN-103	Computer Programming	ESC	4	3	0	2	3	0	15	25	20	40	0
4.	CYN-001	Physical Chemistry	BSC	4	3	0	2	3	0	15	25	20	40	0
5.	HSN-002	Ethics and Self Awareness	HSSC	2	1	1	0	2	0	25	0	25	50	0
6.	CEN-105	Introduction to Environmental Studies	GSC	3	3	0	0	3	0	25	0	25	50	0
7.	HSN-001A/B	Communication Skills (Basic / Advanced)	HSSC	2	1	0	2	2	0	25	0	25	50	0
		TOTAL		21										
(Spring)														
1.	MAN-010	Optimization Techniques	BSC	4	3	1	0	3	0	25	0	25	50	0
2.	PHN-008	Electromagnetic Theory	DCC	4	3	1	0	3	0	25	0	25	50	0
3.	PHN-102	Analog Electronics	DCC	4	3	0	2	3	2	15	25	20	40	0
4.	PHN-104	Mechanics and Relativity	DCC	4	3	1	0	3	0	25	0	25	50	0
5.	EEN-112	Electrical Science	ESC	4	3	1	0	3	0	25	0	25	50	0
6.	CYN-002	Organic and Inorganic Chemistry	BSC	4	3	1	0	3	0	25	0	25	50	0
		TOTAL		24										

PROGRAM CODE : 122 - B.Tech. Engineering Physics
DEPARTMENT : Department of Physics
YEAR : II

Teaching Scheme				Contact Hours/Week			Exam Duration (Hrs.)		Relative Weights (%)					
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
(Autumn)														
1.	MIN-108	Mechanical Engineering Drawing	ESC	4	2	0	4	0	4	0	50	0	0	50
2.	PHN-205	Engineering Analysis and Design	DCC	3	2	0	2	3	0	25	0	25	50	0
3.	PHN-207	Thermal and Statistical Physics	DCC	4	3	0	2	3	0	15	25	20	40	0
4.	PHN-209	Digital Electronics and Circuits	DCC	4	3	0	2	3	0	20	20	20	40	0
5.	PHN-211	Quantum Physics	DCC	3	3	1	0	3	0	25	0	25	50	0
6.	HSN-ELE	HSS Elective Course ¹	HSSMC	3	3	0	0	3	0	25	0	25	50	0
		TOTAL		20										
(Spring)														
1.	MTN-105	Electrical and Electronics Materials	ESC	4	3	1	0	3	0	25	0	25	50	0
2.	PHN-204	Atomic Molecular and Laser Physics	DCC	3	3	0	0	3	0	25	0	25	50	0
3.	PHN-206	Elements of Condensed Matter Physics	DCC	3	3	0	0	3	0	25	0	25	50	0
4.	PHN-208	Nuclear Physics and Applications	DCC	3	3	0	0	3	0	25	0	25	50	0
5.	PHN-210	Mathematical Physics	DCC	3	3	1	0	3	0	25	0	25	50	0
6.	PHN-212	Applied Optics	DCC	4	3	0	2	3	2	15	25	20	40	0
		TOTAL		20										

PROGRAM CODE : 122 - B.Tech. Engineering Physics
DEPARTMENT : Department of Physics
YEAR : III

Teaching Scheme				Contact Hours/Week			Exam Duration (Hrs.)		Relative Weights (%)					
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
(Autumn)														
1.	PHN-311	Numerical Analysis and Computational Physics	DCC	3	2	0	2	3	2	15	25	20	40	0
2.	PHN-313	Signals and Systems	DCC	4	3	1	0	3	0	25	0	25	50	0
3.	PHN-315	Laser & Photonics	DCC	3	3	0	0	3	0	25	0	25	50	0
4.	PHN-317	Plasma Physics and Applications	DCC	3	3	0	0	3	0	25	0	25	50	0
5.	PHN-319	Technical Communication	DCC	2	2	0	0	3	0					
6.	PHN-ELE-1	Departmental Elective *I	DEC	4	3	1	0	3	0					
7.	OEC/ BM-ELE	Open Elective Course/Management Studies Elective Course ²	OEC/H SSME C	3	2	1	0	2	0	25	0	25	50	0
TOTAL				22										
(Spring)														
1.	PHN-310	Applied Instrumentation	DCC	3	3	0	2/2	3	-	15	25	20	40	0
2.	PHN-312	Semiconductor Devices	DCC	3	3	0	2/2	3	-	15	25	20	40	0
3.	PHN-314	Microprocessors and Peripheral Devices	DCC	4	3	0	2	3	-	15	25	20	40	0
4.	PHN-ELE2	Departmental Elective II	DEC	4	3	1	0	3	0	25	0	25	50	0
5.	PHN-300	Industry-oriented Problem / Lab-based Project / Software Engineering-based Project	DCC	4	0	0	6	-	100					
6.	OEC/BM-ELE	Open Elective Course/Management Studies Elective Course ²	OEC/H SSME C	3	3	2	1	0	2	0	25	0	25	50
7.	PHN-399	Educational Tour	DCC	0	0	0	0	0	0	0	0	0	0	0
8.	MSC1/ DHC1	MSC** - 1/ DHC*** - 1 (optional)	MSC/ DHC	4	3	1	0	3	0	25	0	25	50	0
TOTAL				21/25										

PROGRAM CODE : 122 - B.Tech. Engineering Physics
DEPARTMENT : Department of Physics
YEAR : IV

Teaching Scheme				Contact Hours/Week			Exam Duration (Hrs.)	Relative Weights (%)						
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
(Autumn)														
1.	PHN-ELE3	Departmental Elective III	DEC	4	3	1	0	3	0	25	0	25	50	0
2.	PHN-ELE4	Departmental Elective IV	DEC	4	2	1	0	3	0	25	0	25	50	0
3.	PHN-499	Training Seminar	DCC	2	0	2	0	-	0	100	0	0	0	0
4.	PHN-400A	B.Tech. Project	DCC	4	0	0	0	3	0	0	0	0	0	100
5.	MSC2/DHC2	MSC - 2 / DHC - 2 (optional)	MSC/DHC	4	3	0	0	3	0	25	0	25	50	0
6.	MSC3/DHC3	MSC - 3 / DHC - 3 (optional)	MSC/DHC	4	3	0	0	3	0	25	0	25	50	0
TOTAL				14/22										
(Spring)														
1.	PHN-ELE5	Departmental Elective V	DEC	4	3	0	0	3	0	25	0	25	50	0
2.	PHN-ELE6	Departmental Elective VI	DEC	4	3	0	0	3	0	25	0	25	50	0
3.	PHN-400B	B.Tech Project (Contd. from Autumn Semester)	DCC	8	0	0	12	0	0	0	0	0	0	100
4.	MSC4/DHC4	MSC - 4 / DHC - 4 (optional)	MSC/DHC	4	3	1	0	3	0	25	0	25	50	0
5.	MSC5/DHC5	MSC - 5 / DHC - 5 (optional)	MSC/DHC	4	3	1	0	3	0	25	0	25	50	0
TOTAL				16/24										

¹ – Any one course in this category is to be opted either in the Autumn or in the Spring semester in the II year. The course should be selected from the list (basket) of Humanities and Social Sciences Elective Courses.

² – One course each from the OEC and the HSSMEC categories is to be opted either in the Autumn or in the Spring semester in the III year. The HSSMEC course should be selected from the list (basket) of Management Studies Elective Courses.

*DEC - Departmental Elective Course

**MSC - Minor Specialization Course

***DHC - Departmental Honours Course

<u>Departmental Core Courses (DCC)</u>	<u>Departmental Electives (DEC)</u>
<p><u>DCC Year I Spring</u></p> <ol style="list-style-type: none"> 1. Electromagnetic Theory (PHN-008 : 3-1-0) 2. Analog Electronics (PHN-102, 3-0-2) 3. Mechanics and Relativity (PHN-104, 3-0-2) <p><u>DCC Year II Autumn</u></p> <ol style="list-style-type: none"> 4. Engineering Analysis and Design (PHN-205, 2-0-2) 5. Thermal and Statistical Physics (PHN-207, 3-1-0) 6. Digital Electronics and Circuits (PHN-209, 3-0-0) 7. Quantum Physics (PHN-211, 3-0-0) <p><u>DCC Year II Spring</u></p> <ol style="list-style-type: none"> 8. Atomic, Molecular and Laser Physics (PHN-204, 3-0-0) 9. Elements of Condensed Matter Physics (PHN-206, 3-0-0) 10. Nuclear Physics and Applications (PHN-208, 3-0-0) 11. Mathematical Physics (PHN-210, 3-1-2) 12. Applied Optics (PHN-212, 3-0-2) <p><u>DCC Year III Autumn</u></p> <ol style="list-style-type: none"> 13. Numerical Analysis and Computational Physics (PHN-311, 2-0-2) 14. Signals and Systems (PHN-313, 3-1-0) 15. Laser & Photonics (PHN-315, 3-0-0) 16. Plasma Physics and Applications (PHN-317, 3-0-0) 17. Technical Communication (PHN-319, 2-0-0) <p><u>DCC Year III Spring</u></p> <ol style="list-style-type: none"> 18. Applied Instrumentation (PHN-310, 3-1-2/2) 19. Semiconductor Devices (PHN-312: 3-1-2/2) 20. Microprocessors and Peripheral (PHN-314, 3-0-0) 	<p><u>DEC Year III Autumn (Any One)</u></p> <ol style="list-style-type: none"> 1. Digital Image Processing (EE-352 : 3-1-0) 2. Fabrication and Measurement Techniques (PHN-321, 2-0-4) 3. Radiation Detection and Measurements (PHN-323, 3-1-0) 4. Atmospheric Physics and Climate Dynamics (PHN-325, 3-1-0) 5. Physics of Nanosystems (PHN-327, 3-1-0) 6. Superfluidity and Superconductivity (PHN-329, 3-1-0) 7. Nuclear Astrophysics (PHN-331, 3-1-0) <p><u>DEC Year III Spring (Any One)</u></p> <ol style="list-style-type: none"> 8. Principles of Digital Communication (EC-212 : 3-1-0) 9. Properties of Matter and Acoustics (PHN-316, 3-0-2) 10. Data Structures (MA-106 : 3-0-2) 11. Atomic and Molecular Collision Physics (PHN-318, 3-1-0) 12. Fiber and Nonlinear Optics (PHN-320, 3-1-0) 13. Modern Particle Physics (PHN-322, 3-1-0) 14. Nanotechnology (PHN-324, 3-1-0) <p><u>DEC Year IV Autumn (Any Two)</u></p> <ol style="list-style-type: none"> 15. Principles of Remote Sensing (ES-401: 2-1-0) 16. Superconducting Materials (PHN-425, 3-1-0) 17. Digital Signal Processing (EE-355, 3-1-2/2) 18. Quantum Information & Computing (PHN-427, 3-1-0) 19. Nuclear Science & Engineering (PHN-429, 3-1-0) 20. Weather Forecasting (PHN-431, 3-1-0) 21. Introduction to Superstring theory (PHN-433, 3-1-0) 22. Advanced Characterization Techniques (PHN-435, 3-1-0) 23. A Primer in Quantum Field Theory (PHN-437, 3-1-0) 24. Optical Communication Systems (PHN-439, 3-0-3) <p><u>DEC Year IV Spring (Any Two)</u></p> <ol style="list-style-type: none"> 25. Biophysics and Applications (BT-xx, 3-1-0) 26. Emerging Phenomenon in Materials (PHN-422, 3-1-0) 27. Optoelectronics (PHN-424, 3-1-0) 28. Space Technology (PHN-426, 3-1-0) 29. Advanced Electroceramics Technology (PHN-428, 3-1-0) 30. Solar Terrestrial Physics (PHN-430, 3-1-0) 31. Computational Nuclear Physics (PHN-432, 3-1-0) 32. Organic Electronics (PHN-434, 3-0-3)

List of Minor Specialization courses of Physics for other Departments

				Teaching Scheme (Hrs./Week)				
	Subject Code	Course Title	Semester in which the course is running	Subject area	Credits	L	T	P
1	PHN-207	Mechanics and Relativity	Autumn	DCC/MSC	4	3	1	0
2	PHN-211	Quantum Physics	Autumn	DCC/MSC	4	3	1	0
3	PHN-204	Atomic Molecular and Laser Physics	Spring	DCC/MSC	3	3	0	0
4	PHN-206	Elements of Condensed Matter Physics	Spring	DCC/MSC	3	3	0	0
5	PHN-208	Nuclear Physics and Applications	Spring	DCC/MSC	3	3	0	0
Total					17	15	2	0

Department Honor Courses DHC (B. Tech - Engineering Physics)

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CW	PRS	MTE	ETE	PRE
Departmental Elective -I (III Semester: One paper to be chosen)														
1.	PHN-601	Advanced Condensed Matter Physics	PEC	4	3	0	3	3	0	20	20	20	40	0
2.	PHN-603	Advanced Atmospheric Physics	PEC	4	3	0	3	3	0	20	20	20	40	0
3.	PHN-605	Advanced Laser Physics	PEC	4	3	0	3	3	0	20	20	20	40	0
4.	PHN-607	Advanced Nuclear Physics	PEC	4	3	0	3	3	0	20	20	20	40	0
Departmental Electives (III Semester: Three paper to be chosen & IV Semester: Two paper to be chosen)														
5.	PHN-602	Nuclear Astrophysics	PEC	4	3	1	0	3	0	25	-	25	50	-
6.	PHN-604	Physics of Nanosystems	PEC	4	3	1	0	3	0	25	-	25	50	-
7.	PHN-606	Superfluidity and Superconductivity	PEC	4	3	1	0	3	0	25	-	25	50	-
8.	PHN-608	Fiber and Nonlinear Optics	PEC	4	3	1	0	3	0	25	-	25	50	-
9.	PHN-610	Quantum Optics	PEC	4	3	1	0	3	0	25	-	25	50	-
10.	PHN-612	Advanced topics in Mathematical Physics	PEC	4	3	1	0	3	0	25	-	25	50	-
11.	PHN-614	Introduction to Superstring theory	PEC	4	3	1	0	3	0	25	-	25	50	-
12.	PHN-616	Advanced Electroceramics Technology	PEC	4	3	1	0	3	0	25	-	25	50	-
13.	PHN-617	Advanced Characterization Techniques	PEC	4	3	1	0	3	0	25	-	25	50	-
14.	PHN-618	Atomic and Molecular Collision Physics	PEC	4	3	1	0	3	0	25	-	25	50	-
15.	PHN-619	A Primer in Quantum Field Theory	PEC	4	3	1	0	3	0	25	-	25	50	-
16.	PHN-620	Advanced Quantum Field Theory	PEC	4	3	1	0	3	0	25	-	25	50	-
17.	PHN-621	Astrophysics	PEC	4	3	1	0	3	0	25	-	25	50	-
18.	PHN-622	Solar Terrestrial Physics	PEC	4	3	1	0	3	0	25	-	25	50	-
19.	PHN-623	General Relativity	PEC	4	3	1	0	3	0	25	-	25	50	-
20.	PHN-624	Computational Nuclear Physics	PEC	4	3	1	0	3	0	25	-	25	50	-
21.	PHN-625	Particle Physics	PEC	4	3	1	0	3	0	25	-	25	50	-
22.	PHN-626	Advanced Atomic and Molecular Physics	PEC	4	3	1	0	3	0	25	-	25	50	-
23.	PHN-627	Quantum Theory of Solids	PEC	4	3	1	0	3	0	25	-	25	50	-

24.	PHN-629	Weather Forecasting	PEC	4	3	1	0	3	0	25	-	25	50	-
25.	PHN-631	Nuclear Instrumentation	PEC	4	3	1	0	3	0	25	-	25	50	-
26.	PHN-633	Physics and Technology of Thin Films	PEC	4	3	1	0	3	0	25	-	25	50	-
27.	PHN-635	Advanced Nuclear reactions	PEC	4	3	1	0	3	0	25	-	25	50	-
28.	PHN-637	Semiconductor Photonics	PEC	4	3	1	0	3	0	25	-	25	50	-
29.	PHN-638	Advanced Light Sources	PEC	4	3	1	0	3	0	25	-	25	50	-
30.	PNN-639	Superconducting Radio Frequency for particle accelerators	PEC	4	3	1	0	3	0	25	-	25	50	-